

# A HYBRID ELECTRIC VEHICLE AND A METHOD FOR OPERATING A HYBRID ELECTRIC VEHICLE

## Abstract

A hybrid electric vehicle 10 and a method for operating the hybrid electric vehicle 10 is provided. Combustion is made to occur within the internal combustion engine 24 only after the crankshaft 25 of the engine 24 has been rotated by an electric motor or generator 30 to a certain speed and according to a certain ramped or partially ramped profile 114, 112, thereby reducing the amount of emissions from the engine 24, allowing for a more efficient torque transfer to wheels 42, and allowing for a smoother operation of the vehicle 10. The fuel injectors 13, throttle plate 11, and spark plugs 15 are also controlled in order to allow emissions to be reduced during activation of the engine and to allow the catalytic converter 7 to be heated in order to allow these emissions to be further reduced as the engine 24 is operating.